STATUS OF THE CLAIMS

1. (Previously Amended): An apparatus for dielectrophoretic concentration of particles under electrokinetic flow and collecting said particles in a microfluidic channel using a combination of dielectrophoresis and electrokinetic/electroosmotic flow, comprising:

a microfluidic channel section, said microfluidic channel section having a first end and a second end,

means for producing electrokinetic flow in said microfluidic channel section by producing a DC voltage across said first end and said second end of said microfluidic channel section,

said means for producing electrokinetic flow in said microfluidic channel section by producing a DC voltage across said first end and said second end of said microfluidic channel section comprising a positive electrode connected to said first end of said microfluidic channel section and a negative electrode connected to said second end of said microfluidic channel section and a DC power supply connected to said positive electrode and said negative electrode,

at least one pair of interdigitated electrodes located on a surface of said microfluidic channel,

said interdigitated electrodes comprising a first electrode plate having first electrode projecting legs and a second electrode plate having second electrode projecting legs, said first electrode projecting legs and said second electrode projecting legs interlaced, and

means for producing said combination of dielectrophoresis and electrokinetic/electroosmotic flow by producing an AC voltage across said interdigitated electrodes, said means for producing said combination of dielectrophoresis and electrokinetic/electroosmotic flow comprising

an AC power supply connected to said interdigitated electrodes comprising said first electrode plate having first electrode projecting legs and said second electrode plate having second electrode projecting legs which sets up a non-uniform electric field proximate said first electrode plate having first electrode projecting legs and said second electrode plate having second electrode projecting legs, said non-uniform electric field collecting said particles.

2. (Previously Amended): The apparatus of Claim 1, wherein said at least one pair of interdigitated electrodes located on a surface of said microfluidic channel comprises a plurality of pairs of interdigitated electrodes along a length of said microfluidic channel section.

3. (Previously Amended): In a microfluidic device using electrokinetic/electroosmotic flow to sweep particles down a microfluidic channel section for dielectrophoretic concentration of particles under and collecting said particles in said microfluidic channel section using a combination of dielectrophoresis and electrokinetic/electroosmotic flow, said microfluidic channel section having a first end, a second end and an inner section, an improvement comprising:

means for producing said electrokinetic/electroosmotic flow in said microfluidic channel section by producing a DC voltage across said first end and said second end of said microfluidic channel section, said means for producing said electrokinetic/electroosmotic flow in said microfluidic channel section by producing a DC voltage across said first end and said second end of said microfluidic channel section comprising

a positive electrode connected to said first end of said microfluidic channel section and a negative electrode connected to said second end of said microfluidic channel section and a DC power supply connected to said positive electrode and said negative electrode,

interdigitated electrodes patterned on said inner surface of said microfluidic channel section, said interdigitated electrodes comprising a first electrode plate having first electrode projecting legs and a second electrode plate having second electrode projecting legs, said first electrode projecting legs and said second electrode projecting legs interlaced, and

means for producing said combination of dielectrophoresis and electrokinetic/electroosmotic flow by applying an AC voltage across said interdigitated electrodes to set up a non-uniform electric field capable of trapping said particles using a dielectrophoretic force as said particles are swept down the microfluidic channel electrokinetically said means for producing said combination of dielectrophoresis and electrokinetic/electroosmotic flow comprising

an AC power supply connected to said interdigitated electrodes comprising said first electrode plate having first electrode projecting legs and said second electrode plate having second electrode projecting legs which sets up said non-uniform electric field proximate said first electrode plate having first electrode projecting legs and said second electrode plate having second electrode projecting legs, said non-uniform electric field trapping said particles.

4. (Previously Amended): The improvement of Claim 3, wherein said interdigitated electrodes patterened on said inner surface of said microfluidic channel section comprises a plurality of spaced pairs of interdigitated electrode located along a length of said microfluidic channel section.

5. (Previously Amended): The improvement of Claim 3, wherein said patterned interdigitated electrodes each comprises a first section with spaced second and third sections extending transversely from said first section, said first section of each electrode being positioned substantially parallel, with a third

section of one of the electrodes being located intermediate the spaced second and third sections of the other electrode.

6. (Previously Amended): A method for concentrating particles under electrokinetic/electroosmotic flow, comprising:

forming at least one pair of interdigitated electrodes on a fluidic microchannel with said at least one pair of interdigitated electrodes having a multiplicity of first electrode projecting legs and a multiplicity of second electrode projecting legs,

positioning said at least one pair of interdigitated electrodes so that said first electrode projecting legs and said second electrode projecting legs are interlaced, and

sweeping said particles down said fluidic microchannel and trapping said particles by

applying an AC voltage across the interdigitated electrodes to establish a non-uniform electric field capable of trapping particles using an dielectrophoretic force,

controlling said voltage applied to each pair of interdigitated electrodes, and

applying a DC voltage across ends of the fluidic microchannel to initiate an electrokinetic/electroosmotic flow field.

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)